Spaying dogs before or after the onset of puberty different risk for acquired urinary incontinence

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Spaying dogs before or after the onset of puberty: Different risk for acquired urinary incontinence?

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Introduction and aim: Acquired urinary incontinence (AUI) affects up to 20% of spayed dogs. While breed, body weight and size, tail docking, obesity and urethral length are proven risk factors for AUI, the timing of spaying relative to the onset of puberty is still controversially discussed. Spaying puppies before three months of age increased the risk for AUI, but dogs spayed shortly before the first estrus had only about half the risk for AUI compared with dogs spayed after puberty. In other studies time of spaying in relation to the onset of puberty was not revealed as a risk factor for AUI (1). The aim of our study was to investigate the risk factor "time of spaying relative to the onset of puberty" on AUI by controlling for possible confounders.
Materials and methods: A retrospective matched-pair cohort study was carried out on data from 1285 dogs spayed for ≥ 5 years at two veterinary hospitals. The dogs were matched for breed, body weight, age, age at spaying and time interval since spaying. In each pair, one dog was spayed before and one after the onset of puberty. AUI was assessed using an owner questionnaire. A conditional logistic regression for matched pairs for AUI was performed on 131 pairs of dogs. Additionally, observation of canine mammary tumors (CMT) by the owners of the dogs were recorded.
Results: The dogs were 5.4 – 16.9 (9.9±2.6, mean±SD) years old and had been spayed 4.9 - 15.6 (8.8±2.5) years before. Bodyweight varied between 4.5 and 74 kg (26.0±11.7) and body condition score (BCS) between 1.0 and 7.5 (4.7±1.1; assessed on a 9-point scale). These parameters did not differ between the two spay groups, however, dogs spayed before the onset of puberty were younger at the time of spaying compared to those spayed after puberty (0.3 – 1.4 (0.6±0.2) years vs. 0.3 – 8.2(1.8±1.3) years). Time of spaying relative to the onset of puberty was identified in the conditional logistic regression model as the only risk factor for AUI ($p=0.007$), while age, time interval since spaying, bodyweight and BCS posed no risk for AUI. AUI was reported in 30 (22.9%) dogs spayed before puberty, but only in 14 (10.7%) dogs spayed after the first oestrus. CMTs were observed in only 5 dogs, which were all spayed after the onset of puberty between the ages of 0.9 - 8.2 years.
Discussion: Spaying before the onset of puberty was the only risk factor for AUI in our study. However, as matching of pairs was performed for all possible confounders to clearly delineate the effect of the time of spaying relative to onset of puberty on AUI, it is not surprising that these parameters were not identified as risk factors. CMT were only found in dogs spayed after puberty. Timing of spaying has long been known as a risk factor for CMT development (2). Although the scientific evidence was questioned in a systematic review (3), the CMT-sparing effect of spaying before the age of 2.5 years was confirmed recently (4). Due to the low number of pairs included in the study, differentiation between the risk factors "years of ovary exposure" and "time of spaying in relation to the onset of puberty" was not possible.
Conclusion: Spaying before puberty increases the risk for AUI, however postponement means increased risk for CMT. Our results underline the importance of individual counselling not only about pros and cons of spaying, but also in regard to the time of spaying relative to the onset of puberty. Breed predispositions, dog keeping practices and personality of the dog and the owner should be also taken into account.
References 1) Reichler and Hubler, Reprod Domest Anim 2014; 49(2):75-80. 2) Schneider and Dorn, J Natl Cancer Inst 1969; 43(6):1249-61. 3) Beauvais et al., J Small Anim Pract 2012; 53(6):314-22. (4) Waters et al., Vet J 2017; 224:25-37.